



12 October 2004

Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, DC 20554

RE: ISO/IEC JTC 1/SC 31 position regarding BPL as identified in NPRM FCC 04-29

Dear Madam or Sir,

Please accept this letter as the position of the U.S. TAG to JTC 1/SC 31/WG 4 (ADC 1/TG 4) and suggested guidance regarding Broadband over Power Line (BPL) as identified in the FCC Notice of Proposed Rule Making FCC 04-29 of February 2004.

ADC 1 is the U.S. Technical Advisory Group (TAG) within ISO/IEC JTC 1 addressing Automatic Identification and Data Capture Techniques. Within ADC 1 is Task Group 4 (T4) whose responsibility is Radio Frequency Identification (RFID) for item management applications where data is collected by means of radio waves.

Broadband over Power Line makes use of the band 9 kHz to 30 MHz. This band is also used for inductive RFID systems, as identified in ISO/IEC 18000, Part 2 and 3 as well as within anti-theft systems using electronic article surveillance (EAS).

A technical report (see <http://www.savehf.org/lib/isplc2003/isplc2003a7-1.pdf>) shows interferences from BPL up to 340 MHz, so RFID systems operating at 433 MHz, as identified in ISO/IEC 18000-7, may also be affected.

Implementation of these types of RFID systems began to appear in the U.S. in the mid-70s. Today, there are numerous U.S. and European suppliers of such RFID systems and thousands of end user organizations having implemented the technology.

A cornerstone of such RFID systems is that they do not interfere with primary radio users in the 9 kHz to 30 MHz band nor in the 433 MHz band. They accomplish this by transmitting at field strength levels that are relatively low. To cover the read range required by the users' applications the receivers must be very sensitive. Consequently, for the indoor use of RF equipment a relative strong coupling exists between the receiving antennas of these systems and the main building wiring.

RFID systems can be found at the point of purchase, at entrances and exists of the building, within the backroom, and on the store's shelves. Therefore it is difficult if not impossible to identify how these systems might be positioned with regard to the power wiring of the building.

RFID systems have to comply with the conductive - and radiated emission limits provided in Section 15.207 and 15.209. For BPL the same radiated emission limits are applicable. No conductive measurements are necessary.

Normally, disturbances caused by individual electrical apparatus, lighting etc. will exhibit a statistical spread throughout the frequency bands affected. The higher interference level from BPL systems has a considerably more flat continuous spectrum. The interference becomes harmful to RFID systems in an environment where a large number of identical systems are all emitting the same spectrum.

One solution to overcome the interference could be decreasing the read distance, but this again can conflict with the application requirements of the retailers who need certain read ranges.

Likewise, canceling the interference is quite difficult since there is no single source, but a distributed transmitter consisting of all the power lines running throughout a building. Increasing the levels will have a very detrimental effect on RFID systems and may make operation in some existing locations impossible.

Additionally, several ISO standards are written around these inductive technologies operating in the bands below 30 MHz, such as ISO 11784/5 ISO 14225, ISO/IEC 14443, ISO 15693, ISO 18000-2, ISO 18000-3 and for the Airline Industry IATA RPC 1740. Several ISO standards are written or are in development using the 433 MHz technology, including ISO 17363.

Germany proposed radiated emission limits (see attachment NB30 NotificationGermanyGB.doc) related to the current injected (conducted) in the power line with a level of the CISPR 22 Class B limits (Same as FCC Section 15.207).

Within the ETSI/CENELEC JWG a report (see JWG11-07) has been submitted on measurements of BPL. The results show that if injected with a CISPR 22 Class B the radiated emission limits are in line with the NB30.

ADC 1/TG 4 endorses the radiation limits of the NB30 and urges the FCC to implement these limits in the rules concerning Broadband over Power Line. The radiated limits of Part 15.209 are much more relaxed and thus potentially harmful for RFID systems.

ADC 1/TG 4 recognizes that broadband over power line could support broadband data communication, however many alternatives are rapidly becoming available, such as many forms of wireless local loop e.g. WLL, WIFI, UMTS, HiperLAN, ZIGBEE, Satellite, etc. and also fibre.

As described above, the issues under discussion have potentially serious implications for the RFID community. We hope that this letter has broadened the FCC's understanding of the issues and that FCC will seek for a sensible set of emission limits. ADC 1/TG 4 is aware that, once decided, any emission limit will be almost impossible to change, because of the installed infrastructure. It is therefore quite important that emission limits are set at sensible levels.

ADC 1/TG 4 seeks assurances that wideband data transmission networks along the power line will not be permitted with very relaxed radiating limits adversely impacting the operation of existing radio communications systems. In this respect we note, that the Protection Requirements of FCC part 47 Section 15.5 (b) states "Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator".

The understanding is that systems, including BPL, may not cause harmful interference.

If we can provide further information, please feel free to contact us at your leisure.

Sincerely,

A handwritten signature in black ink, appearing to be 'CKH' with a long horizontal stroke extending to the right.

Craig K. Harmon  
Chairman  
ADC 1/TG 4